Space Weather Forecast

Issued on Monday, 21 August 2023 at 13:21 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate class flares (R1-R2; Minor-Moderate radio blackouts). Current high speed stream (HSS) influence likely waning.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is Low. A moderate size region in the southwest remains the most complex region but shows limited activity in recent hours. The recently numbered larger region continues appear over the eastern horizon in the northern hemisphere, though at this stage the regions continues to appear relatively simple and stable. A small new region developed in the southeast disk, and another small region in the southwest waxed and waned. Otherwise there was little change to the other pre-existing regions which remain generally simple and stable. No Earth-directed Coronal Mass Ejections (CMEs) were observed during the period.

Solar Wind / Geomagnetic Activity: The solar wind at Earth has been Elevated to Strong throughout, between 580-620km/s with a peak of 690 km/s noted.. This is now thought to be due to the influence of a previously unidentified trans-equatorial coronal hole currently located around 60W. The associated magnetic field was Weak to Moderate at the start of the period, but has since become predominantly Weak. The important north-south component varied between Weakly positive and Weakly negative. The net result of the above solar wind measures was for Quiet to Unsettled geomagnetic activity (Kp2-3).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar Activity is expected to be mainly Low, but with a Chance of isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: Solar winds are currently enhanced at Elevated to Strong levels likely due to a previously unidentified coronal hole in the western hemisphere. The connection to this feature expected to ease in the next couple of days (to Elevated or Slightly Elevated levels) before the arrival of another coronal hole high-speed stream (HSS) on Day 3 (23 August) likely increases speeds to more persistently Elevated levels once again. This feature then probably eases on Day 4 (24 August). No Earth-directed CMEs feature in the forecast. Geomagnetic activity is forecast to be mostly Quiet to Unsettled (Kp1-3) throughout, but on Day 1 (21 August) and also Day 3 there is the Chance for isolated Active intervals and a non-zero risk of a G1/Minor Storm period.

Energetic Particles / Solar Radiation: No solar radiation storms are expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	25	25	20	20
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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